

Appl. No.: 09/643,073
Amendment after Notice of Appeal dated February 13, 2006
Reply To Office Action of June 9, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously presented) A method of balancing data communications loads among data communications ports in systems for automated trading of securities, the systems including at least one broker-dealer system coupled through at least one data communications system to more than one market system, the method comprising:

sending electronically a first order from a broker-dealer system to a market via a first port connected to said market, there being at least said first port and a second port connected between said broker-dealer and said market;

receiving through said first port from said market to which the first port is coupled an acknowledgment of said first order;

sending the acknowledgment from said first port to the broker-dealer system;

determining that the first port is not overloaded, the determination being dependent upon at least the first order, and the acknowledgment; and

sending a second order through the first port to the market, the sending of the second order being dependent upon the determination that the first port is not overloaded.

2. (Previously presented) The method of claim 1 wherein determining that the first port is not overloaded comprises:

determining that a latency for the first port is less than a maximum allowed latency for the first port, wherein latency comprises a measure of the speed with which markets return acknowledgments for orders.

3. (Previously presented) The method of claim 1 further comprising:

decrementing a net order count for the first port stored in a processor, wherein the net order count indicates a net number of orders sent through the first port to the market for which acknowledgments have not yet been received from the market, wherein the net order count is

Appl. No.: 09/643,073

Amendment after Notice of Appeal dated February 13, 2006

Reply To Office Action of June 9, 2005

decremented after receiving a new acknowledgment.

4. (Previously presented) The method of claim 3 further comprising the steps of:

determining that the net order count for the first port is less than a maximum allowed net order count for the first port, wherein the maximum allowed net order count indicates the maximum number of orders without acknowledgments allowed to be sent through the first port, wherein the net order count being less than the maximum allowed net order count for the first port indicates that the first port is not overloaded; and
incrementing the net order count after receiving a new order.

5. (Previously presented) The method of claim 1 further comprising:

incrementing an acknowledgment count for the first port stored in a processor, wherein the acknowledgment count represents the number of acknowledgments received through the first port during a defined period of time.

6. (Previously presented) The method of claim 5 further comprising the steps of:

determining that an order count for the first port exceeds the acknowledgment count for the first port by at least a maximum allowed net order count, wherein the order count represents the number of orders sent through the first port during the defined period of time, wherein the maximum allowed net order count indicates the maximum number of orders without acknowledgments allowed to be sent through the first port, wherein the order count for the port exceeding the acknowledgment count for the port by at least a maximum allowed net order count indicates that the port is not overloaded; and
incrementing the order count for the first port.

7. (Previously presented) The method of claim 1 further comprising determining, before sending the second order through the first port to the market, that the first port is a least-loaded port, wherein sending the order through the first port to the market is dependent upon determining that the first port is a least-loaded port.

Appl. No.: 09/643,073

Amendment after Notice of Appeal dated February 13, 2006

Reply To Office Action of June 9, 2005

8. (Previously presented) The method of claim 7 further comprising:

determining a net order count for said first port, wherein the net order count for the first port indicates the net number of orders sent through the first port to the market for which acknowledgments have not yet been received from the market, and any other ports coupled to the market also having net order counts, wherein determining that the first port is a least-loaded port comprises determining that the net order count for the first port is not greater than any of the net order counts for the other ports coupled to the market.

9. (Previously presented) The method of claim 7 further comprising:

determining latency for said first port, wherein said latency comprises a measure of the speed with which markets return acknowledgments for orders, wherein any other ports coupled to the market also have latencies, wherein determining that the first port is a least-loaded port comprises determining that the latency for the first port is not greater than any of the latencies for the other ports coupled to the market.

10. (Currently amended) A method of balancing data communications loads among data communications ports in systems for automated trading of securities, the systems including at least one broker-dealer system coupled through at least one data communications system to more than one market system, the method comprising:

sending electronically a first order from a broker-dealer system to a market via a first port connected to said market, there being at least said first port and a second port connected between said broker-dealer and said market;

receiving through said first port from said market to which the first port is coupled an acknowledgment of said first order;

sending the acknowledgment from said first port to the broker-dealer system;

determining that the first port is not overloaded, the determination being dependent upon at least the first order, and the acknowledgment; and

sending a second order through the first port to the market, the sending of the second order being dependent upon the determination that the first port is not overloaded;

Appl. No.: 09/643,073

Amendment after Notice of Appeal dated February 13, 2006

Reply To Office Action of June 9, 2005

determining, before sending the second order through the first port to the market, that the first port is a least-loaded port, wherein sending the order through the first port to the market is dependent upon determining that the first port is a least-loaded port;

determining a net order count and a latency for said first port,

wherein the net order count for said first port indicates the net number of orders sent through the first port to the market for which acknowledgments have not yet been received from the market,

wherein latency for the first port comprises a measure of the speed with which markets return acknowledgments for orders, wherein any other ports coupled to the market have corresponding net order counts and latencies, wherein determining that the first port is a least-loaded port comprises determining that the product of the net order count for the first port multiplied by the latency for the first port is not greater than the product of the net order count and the latency for any of said other ports coupled to the market.

11. (Previously presented) A load balancing system for automated trading of securities in which data communications loads are balanced among data communications ports, the load balancing system coupled to a multiplicity of ports organized so that one market is coupled to the broker-dealer system through more than one port, the load balancing system operative when a new order from a broker-dealer system is available and ready to be sent through a port to said market, the load balancing system operative continually in turn upon each port assigned to said market, the load balancing system comprising:

computer memory;

at least one computer processor coupled for data communications to said computer memory and said broker-dealer system, and coupled through said data communications ports to more than one market, the processor programmed to:

receive through a port from a market to which the port is coupled an acknowledgment of a first order;

send the acknowledgment to the broker-dealer system;

determine that the port is not overloaded, the determination being dependent at least upon the

Appl. No.: 09/643,073

Amendment after Notice of Appeal dated February 13, 2006

Reply To Office Action of June 9, 2005

first order, and the acknowledgment, and
send a second order through the port to the market, the sending of the second order being
dependent upon the determination that the port is not overloaded; and
store in said computer memory by the processor the acknowledgment and the second order.

12. (Previously presented) The load balancing system of claim 11 wherein the processor programmed to determine that the port is not overloaded determines that a latency for the port is less than a maximum allowed latency for the port, wherein latency comprises a measure of the speed with which markets return acknowledgments for orders.

13. (Previously presented) The load balancing system of claim 11 further comprising the processor being programmed to decrement a net order count for the port, wherein the net order count indicates the net number of orders sent through the port to the market for which acknowledgments have not yet been received from the market, wherein the net order count is decremented in response to receiving a new acknowledgment.

14. (Previously presented) The load balancing system of claim 13 further comprising the processor being programmed to:

determine that the net order count for the port is less than a maximum allowed net order count for the port, wherein the maximum allowed net order count for the port indicates the maximum number of orders allowed to be sent through the port without corresponding acknowledgments, wherein the net order count being less than the maximum allowed net order count for the port indicates that the port is not overloaded; and

increment the net order count upon an order being sent through said port after said determination that the net order count for the port is less than the maximum allowed net order count for the port.

15. (Previously presented) The load balancing system of claim 11 further comprising the processor being programmed to increment an acknowledgment count for the port, wherein the

Appl. No.: 09/643,073

Amendment after Notice of Appeal dated February 13, 2006

Reply To Office Action of June 9, 2005

acknowledgment count represents the number of acknowledgments received through the port during a defined period of time.

16. (Previously presented) The load balancing system of claim 15 further comprising the processor being programmed to:

determine that an order count for the port exceeds the acknowledgment count for the port by at least a maximum allowed net order count, wherein the order count represents the number of orders sent through the port during the defined period of time, wherein the maximum allowed net order count indicates the maximum number of orders without acknowledgments allowed to be sent through the port, wherein the order count for the port exceeding the acknowledgment count for the port by at least a maximum allowed net order count indicates that the port is not overloaded; and
increment the order count for the port.

17. (Previously presented) The load balancing system of claim 11 further comprising the processor programmed to determine, before sending the second order through the port to the market, that the port is a least-loaded port, wherein sending the second order through the port to the market is dependent upon the determination that the port is a least-loaded port.

18. (Previously presented) The load balancing system of claim 17 wherein a data structure for the port maintained in one of said processors comprises a net order count for the port, wherein the net order count indicates the net number of orders sent through the port to the market for which acknowledgments have not yet been received from the market, and other ports coupled to the market also have data structures maintained in said processors and having net order counts, wherein the processor programmed to determine that the port is a least-loaded port also is programmed to determine that the net order count for the port is not greater than any of the net order counts for the other ports coupled to the market.

19. (Previously presented) The load balancing system of claim 17 wherein a data structure for the

Appl. No.: 09/643,073

Amendment after Notice of Appeal dated February 13, 2006

Reply To Office Action of June 9, 2005

port maintained in one of said processors comprises latency, wherein latency comprises a measure of the speed with which markets return acknowledgments for orders, wherein the other ports coupled to the market have data structures having latencies, wherein the processor programmed to determine that the port is a least-loaded port also is programmed to determine that the latency for the port is not greater than any of the latencies for any other ports coupled to the market.

20. (Currently amended) A load balancing system for automated trading of securities in which data communications loads are balanced among data communications ports, the load balancing system coupled to a multiplicity of ports organized so that one market is coupled to the broker-dealer system through more than one port, the load balancing system operative when a new order from a broker-dealer system is available and ready to be sent through a port to said market, the load balancing system operative continually in turn upon each port assigned to said market, the load balancing system comprising:

computer memory;

at least one computer processor coupled for data communications to said computer memory and said broker-dealer system, and coupled through said data communications ports to more than one market, the processor programmed to:

receive through a port from a market to which the port is coupled an acknowledgment of a first order;

send the acknowledgment to the broker-dealer system;

determine that the port is not overloaded, the determination being dependent at least upon the first order, and the acknowledgment, and

send a second order through the port to the market, the sending of the second order being dependent upon the determination that the port is not overloaded; and

store in said computer memory by the processor the acknowledgment and the second order.

determine, before sending the second order through the port to the market, that the port is a least-loaded port, wherein sending the second order through the port to the market is dependent upon the determination that the port is a least-loaded port;

The load balancing system of claim 17 wherein a data structure for the port maintained in

Appl. No.: 09/643,073
Amendment after Notice of Appeal dated February 13, 2006
Reply To Office Action of June 9, 2005

said processors comprises a net order count and a latency, wherein the net order count indicates the net number of orders sent through the port to the market for which acknowledgments have not yet been received from the market, wherein latency comprises a measure of the speed with which markets return acknowledgments for orders, wherein any other ports coupled to the market have data structures comprising net order counts and latencies, wherein the processor programmed to determine that the port is a least-loaded port also is programmed to determine that the product of the net order count for the port multiplied by the latency for the port is not greater than the product of net order count and latency for any other port coupled to the market.

21. (Previously presented) The method of claim 1, said determination being made upon at least the presence of the first order, and the presence of the acknowledgment.

22. (Previously presented) The system of claim 11, wherein determining that the port is not overloaded is dependent at least upon the presence of the first order, and the presence of the acknowledgment.